

**ABSTRACT**

A method and system for detecting transverse cracks beneath horizontal cracks in the rail way track. As a transporter moves over rail, a saturation magnetic field is generated into and across the rail head using a toroidal-shaped DC saturation magnet located a predetermined distance above the rail head. Any transverse cracks in the rail head are detected with a low frequency eddy current probe mounted centrally between the opposing pole ends of the DC magnet and over the rail head. A force is applied to the low frequency eddy current probe to hold the probe towards the rail head as the transporter moves on the rail so as to follow the wear pattern of the rail head and to minimize lift-off. A second sensor is used to sense the presence of non-relevant indications that falsely indicate possible transverse cracks by the low frequency eddy current probe.